

Abstract submitted to:

The Third International Conference on Drylands, Deserts and Desertification: The Route to Restoration. November 8-11, 2010, Sede Boqer Campus, Israel

Theme: Remote sensing - tools and implications

Presentation Preference: Oral

Address for correspondence:

Dr. Charles ICHOKU
Climate and Radiation Branch, Code 613.2
NASA Goddard Space Flight Center
Greenbelt, MD 20771, U.S.A.

Phone : (1) 301-614-6212
Fax : (1) 301-614-6307 or (1) 301-614-6420
E-mail : Charles.Ichoku@nasa.gov

Abstract Title:

Possible effects of seasonal fires on drought across the Northern sub-Saharan African region

Charles Ichoku

NASA Goddard Space Flight Center, code 613.2, Greenbelt, MD 20771, USA.

ABSTRACT

Recent satellite-based studies have revealed that the northern sub-Saharan African (NSSA) region has one of the highest biomass-burning rates per unit land area among all regions of the world. Because of the high concentration and frequency of fires in this region, with the associated abundance of heat release and gaseous and particulate smoke emissions, biomass-burning activity is believed to be a major driver of the regional carbon, energy, and water cycles. We acknowledge that the rainy season in the NSSA region is from April to September while biomass burning occurs mainly during the dry season (October to March). Nevertheless, these two phenomena are indirectly coupled to each other through a chain of complex processes and conditions, including land-cover and surface-albedo changes, the carbon cycle, evapotranspiration, drought, desertification, surface water runoff, ground water recharge, and variability in atmospheric composition, heating rates, and circulation. In this presentation, we will examine the theoretical linkages between these processes, discuss the preliminary results based on satellite data analysis, and provide an overview of plans for more integrated research to be conducted over the next few years.

Brief biographical sketch of the Author:

Dr. Charles Ichoku obtained his Bachelor of Science (B.Sc) degree in Surveying, Geodesy, and Photogrammetry, and his Master of Science (M.Sc) degree in Photogrammetry and Remote Sensing, both from the University of Nigeria, Enugu

Campus, in 1982 and 1987, respectively. He then proceeded to pursue his doctoral studies in France at the Université Pierre et Marie Curie, Paris, where he received the Diplôme d'Études Supérieures Spécialisées (DESS) degree in Remote Sensing and the Ph.D degree in Earth Sciences, in 1989 and 1993, respectively. He worked as a research fellow at the Jacob Blaustein Institute for Desert Research, Ben-Gurion University of the Negev, Sede Boker Campus, Israel, from 1993 to 1997, then as a visiting scientist at the Max-Planck Institute for Chemistry, Mainz, Germany, from 1997 to 1998. In 1998, he joined the NASA Goddard Space Flight Center (GSFC) in Greenbelt, Maryland, USA under contract from Science Systems & Applications, Inc. (SSAI), and in 2006 became affiliated with the joint NASA/University of Maryland's Earth System Science Interdisciplinary Center (ESSIC). In 2008, he was appointed to full NASA official position as a Research Physical Scientist. His activities over the years have included developing and applying both experimental and remote sensing approaches to research in various branches of the earth sciences, including geology and geodynamics, hydrology, and atmospheric studies. He has published more than 40 papers in peer-reviewed scientific journals. Currently, he is actively involved in the development of innovative remote sensing techniques for global characterization of fires, their smoke emissions, and atmospheric aerosols in general, as well as evaluating their impacts on the environment and climate.